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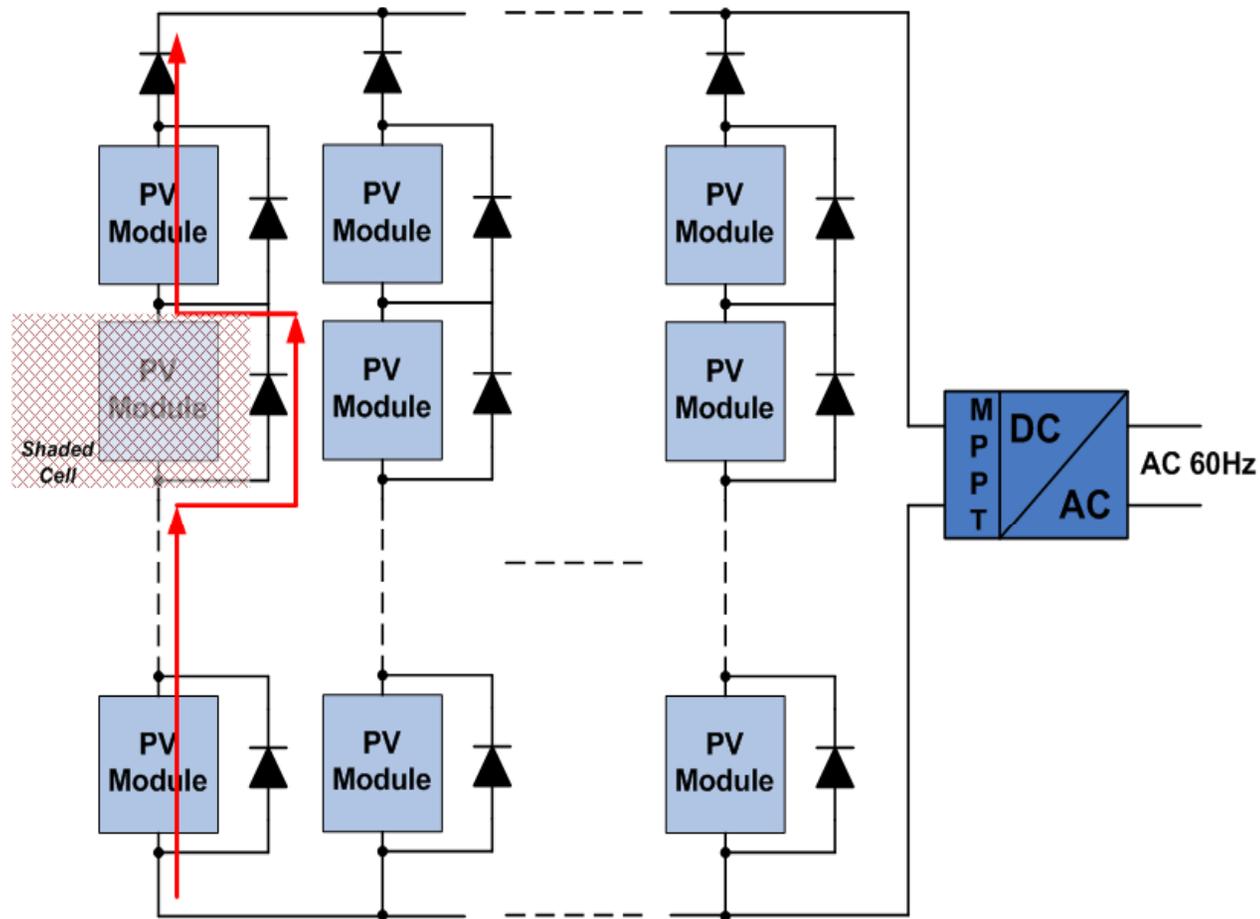
Impact of Shading on PV Systems

National Semiconductor

September 29, 2008



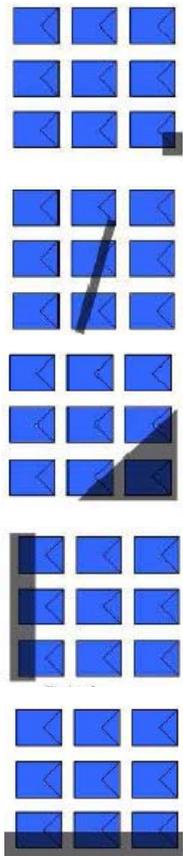
Problems with Today's PV Systems



Case Study #2 – Impact of Shading

Paper from INES R.D.I., Laboratory for Solar Systems in France

Nine (multi-crystalline) Photowatt PW1650 (4 bypass diodes) connected in series and in a 3x3 string configuration to a SMA Sunny Boy SB1100 inverter



Shade	Power loss Series connection	Power loss 3x3 connection
0.15%	3.7%	1.7%
2.6%	16.7%	7%
13.9%	22%	36.8%
11.1%	36.5%	30.5%
12.5%	18.3%	17%

Case Study #3 – Customer Field Trial (con't 2)



Time	% of Array Shaded	Power Loss due to Shade	% of Lost Power Recouped by SolarMagic
09:30am	13%	44%	50%
10:30am	11%	47%	58%
11:30am	9%	54%	66%
12:30pm	6.5%	44%	65%
02:30pm	3%	25%	40%

Tomorrow's PV systems

